

# EXHIBIT A

## ACCIDENT CAUSE & ANALYSIS

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### Collision Reconstruction Report

Sara Echevarria vs. U-Haul Company

Delaware State Route 2 near the Intersection of Upper Pike  
Creek Road

Newark, Delaware

Date of Accident: May 15, 2004

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Date of Report: October 20, 2006

## Accident Cause and Analysis

### 1.0 Introduction

ACA was requested to conduct a file review and field investigation regarding a vehicle collision involving a 2003 Volkswagen Jetta and 1988 International Navistar towing a 12-foot enclosed trailer. The specific purpose was to analyze the case information and determine whether a collision reconstruction analysis could be performed within a reasonable degree of scientific/engineering certainty.

The collision events, which occurred on May 15, 2004, can be summarized as follows: a 2003 Volkswagen Jetta (referred throughout the report as V<sup>1</sup>), operated by Ms. Sara Echevarria, was traveling eastbound on State Route 2 in the left hand travel lane passing through the intersection of Upper Pike Creek Road.

A 1988 International Navistar towing a 12-foot enclosed trailer (referred throughout the report as V<sup>2</sup>), being driven by Mr. Roger Mayfield and owned by U-Haul Company, was traveling westbound on State Route 2 in the left hand travel lane approaching the intersection of Upper Pike Creek Road.

The 12-foot trailer became detached from its truck hitch and traveled into the eastbound travel lane after crossing the median where it struck V<sup>1</sup>'s driver's door. The impact caused V<sup>1</sup> to roll over onto its roof causing serious injuries to Ms. Echevarria.

### 2.0 Objective

The specific purpose was to analyze the case information and determine whether the cause and/or causes of the collision could be accurately determined within a reasonable degree of engineering/scientific certainty regarding the sequence of collision events.

## **Accident Cause and Analysis**

### **3.0 Activities of Objective**

In summary, the investigation activities performed by the writer in the evaluation of the objective involved:

1. Review of Delaware State Police Report #06-04-54496 along with the Commercial Vehicle Inspection Report and their color photographs.
2. A complete site inspection on October 18, 2006 and the inspection of an International Navistar owned by U-Haul on October 18, 2006.
3. Review of the following depositions:
  - Mr. Todd Rarick (U-Haul Representative) dated July 26, 2006.
  - Mr. Roger Mayfield (Defendant) dated July 26, 2006.
  - Ms. Sara Echevarria (Plaintiff) dated March 13, 2006.
4. Review of Ms. Sara Echevarria's statement taken on 1/20/05.
5. Review of the complete discovery file forwarded by U-Haul Company including 61 color photographs of the involved truck and trailer.
6. Review of the Plaintiff's and Defendant's Answers to Interrogatory Questions.
7. Review of U-Haul's Rental Vehicle User Instructions and Trailer User Instructions downloaded from U-Haul's web site on October 3, 2006.
8. Review of the manufacturers' specifications of the involved vehicle, truck and trailer.

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9. Review of engineering reference texts for the applicable engineering principles.

*(Writer's Note: The defendant's truck and trailer were not available for an inspection.)*

### 4.0 Police Accident Report Observations

Review of the Delaware State Police Report #06-04-54496 along with their Commercial Vehicle Inspection Report indicated the following:

1. The accident event occurred May 15, 2004 at 12:09 p.m. on Delaware State Route 2 near the intersection of Upper Pike Creek Road in Newark, Delaware.
2. A 2003 Volkswagen Jetta was operated by Ms. Sara Echevarria (V<sup>1</sup>). A 1988 International Navistar towing a 12-foot enclosed U-Haul trailer was being driven by Mr. Roger Mayfield (V<sup>2</sup>). There were no passengers in V<sup>1</sup> or V<sup>2</sup>. There were two listed eyewitnesses.
3. The vehicles impact configuration, pre and post travel paths and their final rest positions; physical evidence and roadway configuration were drawn on a scene diagram.
4. The Police made the following observations and conclusions in their investigation:
  - a. The point of impact between V<sup>2</sup>'s trailer and Ms. Echevarria's vehicle occurred on the east side of the roadway where Ms. Echevarria was initially traveling.
  - b. The U-Haul trailer was not secured properly when the trailer broke free.

### **Accident Cause and Analysis**

- c. The safety chains were still intact on the trailer but the tongue adjustment on the trailer was not screwed down.
- d. The weather was clear with a dry roadway.
- e. The posted speed limit for Delaware State Route 2 was 45 MPH.

#### **5.0 Examination of Accident Location:**

The writer conducted a complete scene inspection on October 18, 2006. The scene inspection, roadway markings and case file photographs indicated that no pertinent design changes have occurred to State Route 2, at the collision location, from the period of May 15, 2004, to October 18, 2006.

1. State Route 2, at the collision location near the intersection of Pike Creek Road, was a properly divided six-lane roadway that traveled in a west/east direction. The roadway had the proper lane delineations and transverse markings for the travel lanes as seen in photograph #1.

**Photograph #1: State Route 2 at the collision location near  
Pike Creek Road  
(Writer's Photograph)**



### **Accident Cause and Analysis**

2. State Route 2 (westbound), at the collision location before the intersection of Upper Pike Creek Road, had the following design features:
  - (a) A level elevation prior to the point of impact with a cross slope for drainage purposes.
  - (b) The roadway was a straight design configuration with worn bituminous asphalt in adequate repair.
3. State Route 2 (eastbound), at the collision location after the intersection of Upper Pike Creek Road, had the following design features:
  - (a) A level elevation prior to the point of impact with a cross slope for drainage purposes.
  - (b) The roadway was a straight design configuration with worn bituminous asphalt in adequate repair.
4. The posted speed limit for State Route 2, at the collision location, was 45 MPH.

6.0

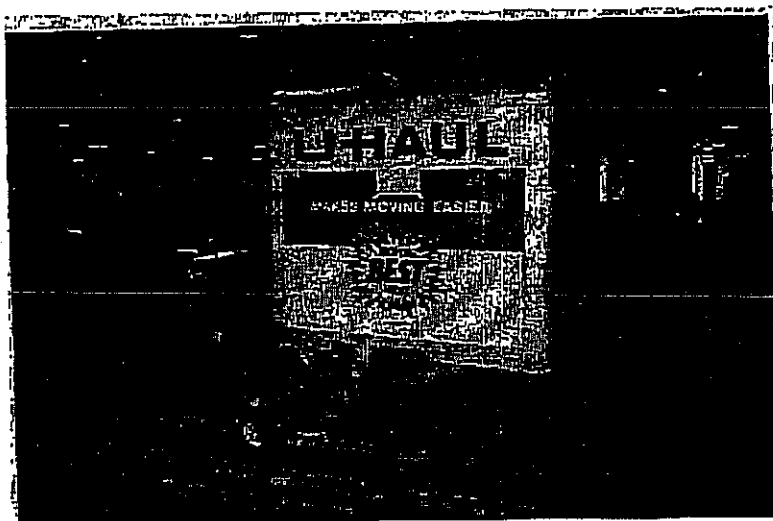
#### **Damage Analysis for the 12-foot enclosed U-Haul Trailer (V<sup>1</sup>)**

The damage analysis for the 12-foot enclosed U-Haul trailer was based on the color case file photographs.

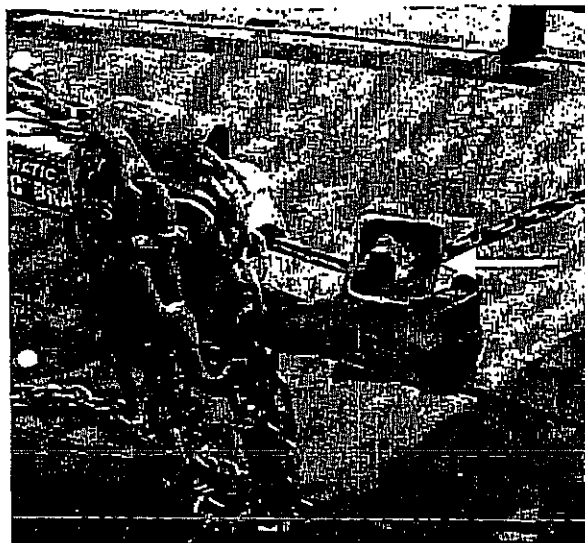
The majority of the damage to the 12-foot U-Haul trailer was located at the front tongue, which struck and penetrated the side of V<sup>1</sup> resulting in its rollover onto the roadway. The trailer's associated frontal view and tongue damage can be seen in photographs #2 and #3.

## Accident Cause and Analysis

**Photograph #2: Frontal View of the 12-Foot U-Haul Trailer (Case File Photograph)**



**Photograph #3: Tongue Damage to the 12-foot U-Haul Trailer (Case File Photograph)**

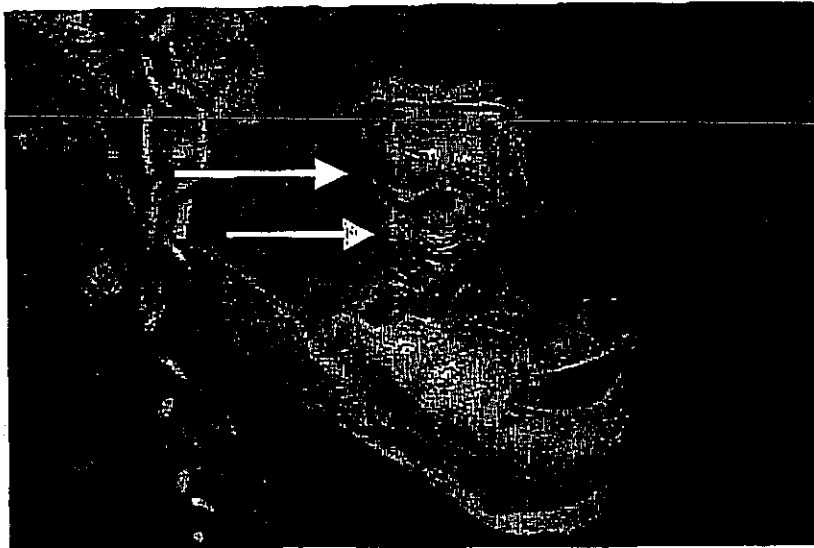




### Accident Cause and Analysis

The trailer's hand wheel and locking clip were damaged, which serve to secure the trailer tongue to the 2" hitch ball welded onto the back bumper of the subject truck. The damaged hand wheel can be viewed in photograph #4.

**Photograph #4: Damage Hand Wheel on the U-Haul Trailer**



The hand wheel (noted by a white arrow), which tightens and secures the tongue to the ball hitch, is a unique design used by U-Haul and not commonly seen on towing combination. The hand wheel is attached to a threaded nut (noted by a yellow arrow), which tightens as it is moved in a clockwise fashion.

To prevent a total separation of the trailer to the subject truck, two breakaway chains located on the trailer are attached to the truck. In addition, one emergency brake chain, which applies the trailer's brakes when complete separation occurs, is hooked onto one of the breakaway chains.

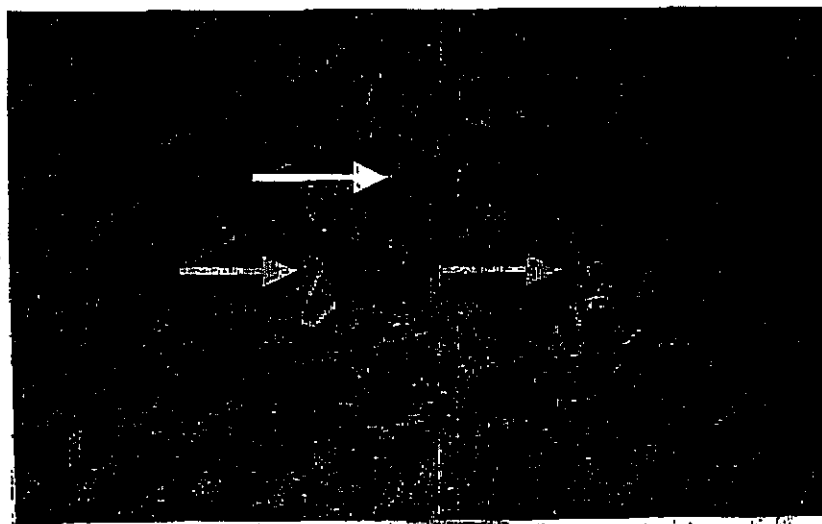
### **Accident Cause and Analysis**

As viewed in the photographs, one breakaway chain and the emergency brake chain along with their S-hooks seemed to be undamaged. However, the left S-hook attaching the breakaway chain was obviously bent.

The observed left S-hook deformation was caused by the center brake chain being attached thus applying more force when the trailer detached from the truck.

The conditions of the chains and their associated S-hooks can be seen in photograph #5.

**Photograph #5: Emergency Brake Chain and  
Breakaway Chains for 12-foot  
U-Haul Trailer  
(Case File Photograph)**



**Note:**

**One Emergency Brake Chain**

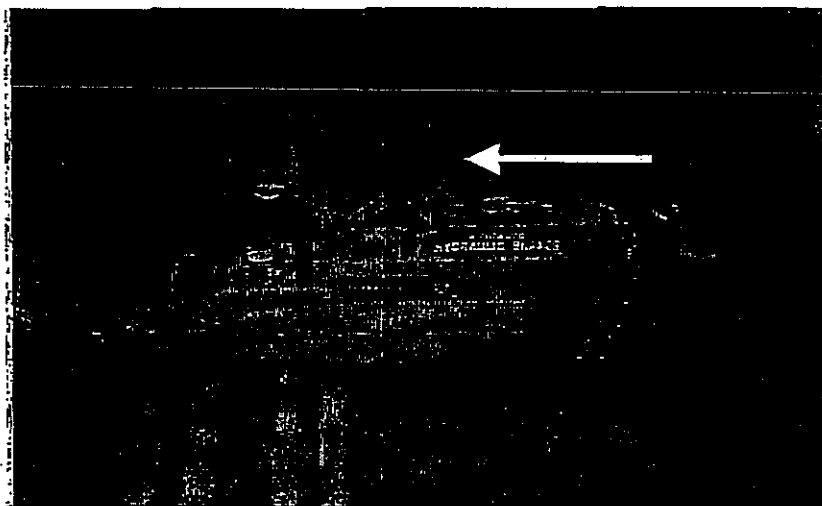


**Two Breakaway Chains**

### Accident Cause and Analysis

It can also be accurately determined that the emergency brake chain was attached to the truck due to the red emergency brake lever being lifted and manually applying the brakes to the trailer as seen on photograph #6:

**Photograph #6: Emergency Brake Lever on the Trailer (Case File Photograph)**



#### **7.0 Damage Analysis for the 1988 International Navistar (V<sup>1</sup>)**

The damage analysis for the 1988 International Navistar was based on the color case file photographs.

There was no damage to the subject truck since it was not involved in the collision. However, certain observations were important in the detachment of the trailer as described in the previous section.

First, a frontal overview of the subject truck without any noticeable contact damage can be seen in photograph #7.

### **Accident Cause and Analysis**

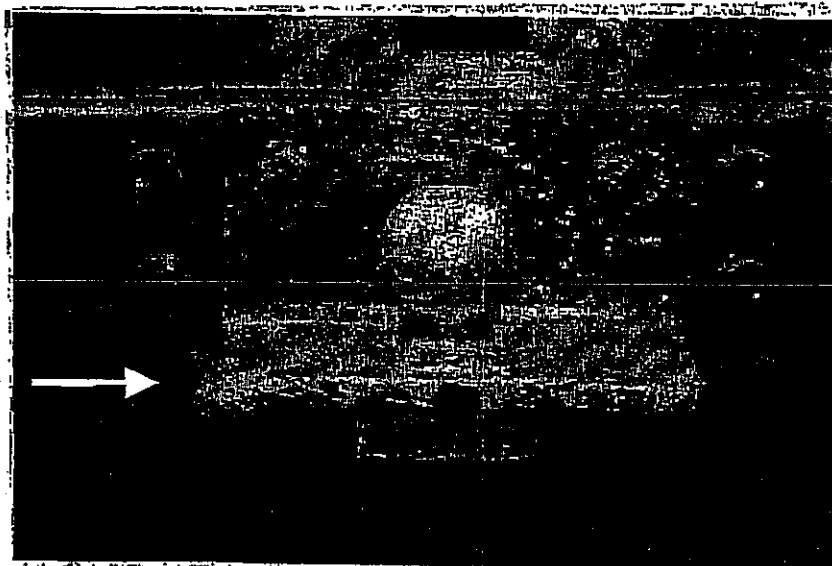
**Photograph #7: Frontal View of the 1988 International Navistar (Case File Photograph)**



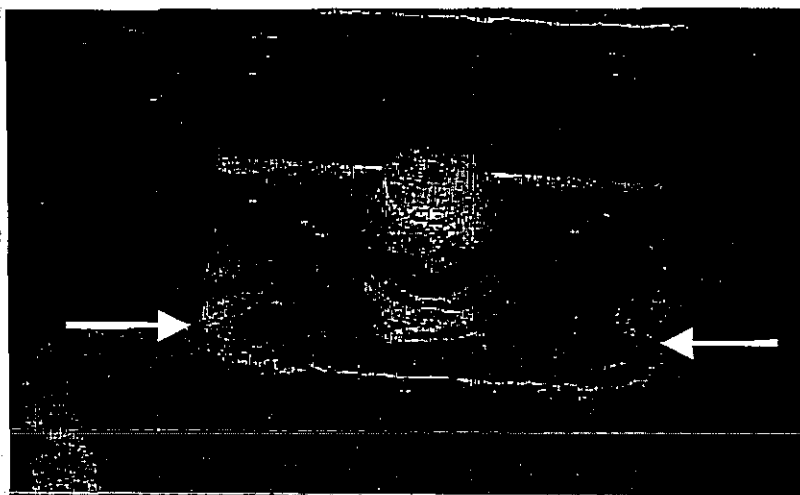
The 2" ball hitch, to which the trailer would be attached, was bolted to the back frame and welded onto an L-shape bracket with holes on either side as seen in photographs #8 and #9:

### Accident Cause and Analysis

**Photograph #8: Two Inch Ball Hitch attached to the Back Bumper (Case File Photograph)**



**Photograph #9: Holes on Either Side of 2-Inch Ball Hitch (Case File Photograph)**



### Accident Cause and Analysis

Based on the writer's field investigation, there was insufficient space next to the center ball to place and successfully use an additional size-towing ball as suggested in testimony from Mr. Todd Rarick (U-Haul Representative). In addition, the 2-inch ball observed above would not be able to be removed due to it being welded onto the metal mount.

In fact, the deformation of the left hole on the L-bracket (noted by a white arrow in photograph #10) would indicate that other functions such as breakaway chains being attached were placed within the subject holes and not caused by other tow hitch balls being used during the operation of this subject truck.

### 8.0 Deposition Summary

The following deposition summaries are provided to help understand and evaluate the collision events<sup>1</sup>:

1. The deposition of Mr. Roger Mayfield (Defendant-V<sup>2</sup> Operator) can be summarized as follows regarding his testimony into the use of the truck/trailer combination and the collision events:
  - He was driving a 1988 International Navistar rental truck and 12-foot trailer from U-Haul of Florida that he picked up in Florida (p.3, 10)
  - He had experience towing various other trailers (p.5-6)
  - He helped the rental person hook up the trailer but he seemed in a rush (p.10, 15)
  - He planned on having the unit (truck and trailer) for a one-way rental (p.12)

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The selection of portions of the depositions are to provide an overview of the testimony and does not prevent the expert from relying on other portions of the listed depositions

### Accident Cause and Analysis

He signed the renter's agreement without being required to read the U-Haul User's Manual (p.13)

The trailer had a screw down coupler mechanism. There was a clip like a lock washer that did not seem to be working in conjunction with the coupler. (p.15)

There were two chains and a brake chain. (p.16-17)

The U-Haul representative attached all three chains to the truck.

He attached the brake chain to the cross chains. (p.17)

The safety chains were attached straight through the holes near the ball hitch. The S hooks on the chains did not fit all the way through the holes. (p.19-20)

The chains were crossed underneath the tongue. (p.21)

The U-Haul representative did not mention that the recommended maximum travel speed was 45 MPH. (p.25)

The U-Haul representative did not explain what to do if he experienced control problems with the trailer. (p.25)

The trailer was  $\frac{3}{4}$  full. (p.28)

He went from the U-Haul location to his home first. He noticed at that time the trailer hitch was a little loose (p.30)

He checked the trailer all the time during the course of his trip. The trailer hitch was a little loose during various stops along his trip. The clip did not seem to have any tension. He kept tightening the clamp back down. (p.30, 33)

At Rocky Mount, he did detach the trailer to on-load the contents. (p.36)

He stopped at a U-Haul dealership in Rocky Mount, North Carolina. They checked and tightened down the trailer hitch (p.38)

He was traveling 40-45 MPH when the trailer detached prior to the accident. (p.45)



### Accident Cause and Analysis

2. The deposition of Mr. Todd Rarick (U-Haul Representative) can be summarized as follows regarding his involvement into the rental of the unit to Mr. Mayfield and U-Haul policy and procedure:

- He was a corporate designee from U-Haul of Florida. His position was general manager. (p.3,5)
- At his location they had nine trucks and three trailers. (p.9)
- All box trucks except for the 10-foot type had trailer hitches with a 2-inch ball. (p.13)
- All hitches would have an L-shape bracket where the ball would be welded to the bracket and then bolted onto the bumper and frame of the truck. (p.14)
- During the safety inspection before the rental, they check the ball for cracks and damage. (p.15-16)
- The trailers are inspected every 30 days if it is transferred from another U-Haul site (p.18)
- The hand wheel assembly is a square bolt that turns and tightens the trailer to the hitch. (p.20-22)
- They routinely cross the chains underneath the bumper and attached the brake chain to the left side. (p.25-26,38)
- The mandatory safety inspection includes the use of a special tool to assure the tongue is tightened to the hitch. (p.26-27)
- The *Every Rental Inspection* was conducted before Mr. Mayfield rented his unit. (p.31-32)
- He did not know if U-Haul safety certified the trailer prior to renting it to Mr. Mayfield. (p.37-38)
- He did not know if an employee of U-Haul of St. Petersburg hooked up the trailer for Mr. Mayfield. (p.40)
- The renter is given instructions about the safe hauling of trailers in an *Addendum and User's Guideline*. The renter needs to sign the document before leaving the location. They do not assure the renter reads the document. (p.42,44)



### Accident Cause and Analysis

They give the renter verbal instructions before leaving with the trailer. (p.45)

The regular brakes on the Mayfield trailer had surge brakes. They activate by the inertia of the trailer pushing against the tow vehicle. The emergency brake is set up with a brake away chain. If the unit detaches, the emergency brake will lift up and manually apply the brakes to the trailer. (p.47-48)

The employee of U-Haul did conduct the six-point inspection before renting the unit to Mr. Mayfield. He did not know if the 140-point inspection was conducted. (p.51-52)

They recommended that people do not disconnect the trailer to load or unload. (p.62)

3. The deposition of Ms. Sara Echevarria (Plaintiff) can be summarized as follows her testimony into the collision events:

- She was traveling between 40-45 MPH (p.42)
- At a quick glance, she saw the trailer swaying while still apparently still connected to the truck (p.43-44)
- She did not see the trailer come across the median (p.45)

### 9.0 Observations and Opinions

The following opinions and analysis are provided to help understand and evaluate the collision events<sup>2</sup>:

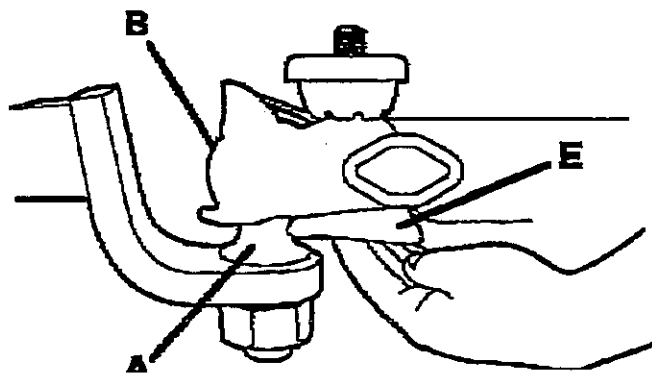
1. The coupler device used by U-Haul to attach their trailer to the ball hitch was outlined in the U-Haul's *Trailer User Instructions* and can be viewed below:

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<sup>2</sup> The selection of portions of the depositions provided an overview of the testimony and does not prevent the expert from relying on other portions of the listed depositions

## Accident Cause and Analysis

**Figure 1: U-Haul Coupler**



The tongue attachment to the hitch consisted of a latch clip and a hand wheel assembly. By turning the hand wheel assembly clockwise, it tightens the tongue to the 2-inch tow ball attached to the hitch. If the hand wheel is damaged or malfunctions, the trailer will not be properly attached and will become detached during the normal driving operation of the trailer.

During the routine six point inspection conducted by U-Haul prior to rental of this unit to Mr. Mayfield, the components of the trailer's coupler were not properly inspected nor was Mr. Mayfield given the proper instructions regarding the attachment and proper use of the trailer during his cross country towing of this trailer.

If U-Haul had completed a thorough inspection, they would have detected a problem with the trailer's hand wheel thus preventing the detachment of the trailer from the truck.

## **Accident Cause and Analysis**

### **9.0 Conclusions**

My conclusions, contained within this report, are reached with a reasonable degree of scientific/engineering certainty and are as follows:

1. Ms. Sara Echevarria, driving a 2003 Volkswagen Jetta, was traveling eastbound on State Route 2 in the left hand travel lane passing through the intersection of Upper Pike Creek Road.
2. Mr. Roger Mayfield , driving a 1988 International Navistar towing a 12-foot enclosed trailer owned by U-Haul Company, was traveling westbound on State Route 2 in the left hand travel lane approaching the intersection of Upper Pike Creek Road.
3. As Ms. Echevarria was traveling eastbound, The U-Haul trailer being towed by Mr. Mayfield became fully detached from his truck's hitch and crossed into the eastbound travel lane. The collision between the Volkswagen Jetta and the 12-foot enclosed U-Haul trailer occurred in Ms. Echevarria's proper travel lane on Delaware State Route 2.
4. There was no physical evidence noted by the police at the collision location that would indicate Mr. Mayfield was exceeding the recommend travel speed of 45 MPH when the trailer became detached from the back tow hitch.
5. Prior to the collision event, Mr. Roger Mayfield failed to prevent the U-Haul trailer from becoming fully detached from his truck. His actions were contributory to the cause of this collision.
6. U-Haul rented to Mr. Mayfield a defective trailer coupler mechanism, which allowed for the complete detachment of the trailer and ultimate impact with Ms. Echevarria's vehicle. U-Haul's negligence was a contributory cause of this collision.

### Accident Cause and Analysis

7. U-Haul's destruction of evidence including the disposal of the subject trailer coupler mechanism prevented the writer from identifying the exact nature of the coupler mechanism defect.

I remain available to supplement this collision reconstruction report, as additional information is received, or as you require.

Respectfully,



Frank Costanzo  
Senior Collision Reconstructionist/ACA